VMI's Best of the Best

2011 CES Technology & Predictions Review

International CES®

2011 INTERNATIONAL CES IN LAS VEGAS

VMI CES 2011 Review

- ***Welcome back to VMI's Best of the Best CES Technology and Predictions Review. VMI team members once again traveled the halls at CES to find and bring to you their pick of top innovations and what's next.***

Background 2011 Consumer Electronics Show

- ***CES attracts the "who's who" of the technology and related industries,*** including C-level executives from the entertainment, wireless and consumer electronics (CE) industries
- ***140,000 visitors; representing 130 countries viewed 2,700 exhibits – a 9% increase*** in attendees over the 2010 Show
- The show ***represents an estimated $182B United States shipment revenue of consumer electronics***

➔ *Top Innovations*

- ***Gesture-based user interfaces; Optionally "manned" vehicles; Augmented Reality; Robotics; 3D Technology; Integration & Connectivity*** … and from VMI's point of view a ***few outliers in the mix…***

LET'S START WITH
2010 PREDICTIONS: THEN AND NOW
2011 PREDICTIONS: NEXT

VMI 2010 Predictions: Then & Now

➔ The expected adoption of any new or evolving technology often deviates from even the best analysts' predictions. We're happy to report, VMI's predictions were mostly right on!

- ***Apps Prediction 2010:*** Mobile device applications will explode, (especially so, after seeing an app that turns your iPhone into a TV remote control)
  - ***2011 Now:*** Apps are everywhere, intertwined and embedded into everyone's daily lives from the vehicles to household items such as refrigerators – and the growth will continue
  - ***Next, Continuation of Instant On: Web/App Presence*** – With so many electronic device now web enabled, there will be major changes in the ways many company's do business; enabling benefits such as ***prognostics, direct and immediate interaction*** with end users and ***more rapid rollout of new products*** to the market

Robotics Prediction 2010: Robotics will need to demonstrate meaningful purpose to breakout of the entertainment/toy segment

- ***2011 Now:*** Following the goal of efficiencies and ease of use, ***robotics and automation are progressing further into the household and everyday life***, from vacuums to health and medication administration
- ***Next:*** With the cross over of some military technologies into automobiles such as GM/SAIC's EN-V optionally manned vehicle, look to next year's CES where we'll see self correcting, consumer-ready vehicles

VMI 2010 Predictions: Then & Now

➔ Because of competing disruptive innovations, some inventions fell by the wayside

- ***Media Extenders 2010 Prediction:*** Stand alone set top boxes such as Boxee and Slingplayer will be beat out by integrated systems
  - ***Now:*** TVs and mobile devices with integrated network connectivity and app stores ***(e.g. NetFlix)*** have bypassed the need for set top box
  - ***Next: Within four years, more than 70%* of all mainstream consumer electronics are expected to be connected to the web via Cloud Computing… kiss your workstation goodbye***

- ***Mobile Reader 2010 Prediction:*** Sophisticated E-readers (color E-Readers with the promise of full-motion video windows) are more of a stepping stone towards the advancement of true *mobile computing*
  - ***Now:*** While not at CES in an official manner (Steve Jobs continues to refuse to participate because of MacWorld), **the iPad has all but killed the E-Reader "Que" category as it was known last year**
  - ***Next:*** Multi-tasking Android Tablets…

** Source: CES Vision Magazine, Jan/Feb 2011*

VMI 2010 Predictions: Then & Now

- ***3D Television 2010 Prediction:*** 3D systems will not go mainstream until cheaper and more consumer friendly systems are developed ($20K 42-inch 3DTV)
  - ***Now:*** Cheaper, lighter 3-D glasses have lowered the consumer price point (factor of 10) and barriers to adoption, opening up the technology to a larger audience base
  - ***Next:*** From BMW to high end sports gear, ***3D lense-technology will further enable augmented reality applications,*** which will be at the forefront of next year's CES

- ***Gesture / Intuitive Controls 2010 Prediction:*** The use of gesture based controls will enable considerable interface advantages over previous peripherals, and see breakthrough use in consumer products
  - ***Now: Move over Wii… enter Microsoft Kinect***
  - *Manipulation technology* as seen in tablets, touch screens, TVs and gaming were in abundance
  - ***Next:*** Nearly every device with a viable user interface will be altered to obtain gesture based input, creating endless possibilities as our world and experiences become more connected

TOP INNOVATIONS
2011 CES SHOW

Gesture-Based and Adaptable User Interfaces

- **Gesture-based control systems hitting main stream**
  - **iPad touch-less controls** by **Norwegian Elliptic Labs** allowing for swipe type movement interaction
    - **AikenLabs** connects to any system that uses USB peripherals – allowing small attachable nodes to communicate with the host creating a network of motion based sensors that can be mapped to specific commands
    - **Microsoft Kinect for the XBOX** uses motion and gesture based controls to play games and provide system commands
- **Adaptive keyboard**
  - **Razor's Switchblade** is a small laptop with an adaptive keyboard, allowing for each button (LED key) to visually represent a specific action based on the game being played

Vehicles: Optionally-Manned, Wireless Charging

- Optionally-manned EN-V: Produced by a JV between **GM** and **China-based SAIC**
- Electric vehicles: **Ford Focus, Nissan Leaf, Hyundai, Audi,** and more
- **Tesla's wireless charging** of their electric car by parking it over a 4" eCoupled-enabled pad. Once the car is fully charged, it will run for 180 miles. *(Competition for the George Foreman Grill!)*

Vehicle Connectivity

- In-vehicle connectivity is becoming a key feature for new cars
  - **Ford's AppLink**, an update of SYNC allows certain smartphone apps to be controlled through voice commands
  - **Toyota Entune** infotainment system connects to smartphone, integrates mobile apps from Bing, iHeartradio, Movietickets.com, and Opentable.com
  - **Tesla**'s prototype Model S features 17" center display by **Tegra** and **Nvidia**
  - **Audiovox's** aftermarket safe driver technology, complete with alerts for lane wandering and possible collisions
  - **Mavizon** allows for connnectivity of your cars health and location via a cell phone app and your car's diagnostic port

Augmented Reality

- **Pioneer's Laser Head Up Display** provides a vehicle navigation system in the windshield
- **BMW** offers 3D augmented reality GPS by **Nvidia**

- **Recon's HUD for snowboarders, allowing for** real-time speed, jump hang-time, vertical gain/loss, altitude and temperature

- **Vuzix** augmented reality *see-through* eyewear (company also partnering with **Roboteam**)

Robotic Technology

Roboteam's SAFIRE imaging device layers real-time video with distance and depth perception sensors for robots and human augmented reality systems

- **iRobot's toilet scrubbing robot** – (not in, but around base) demonstrates the company's continued efforts to create robots for *dull, dirty & dangerous* tasks (vacuuming, mopping, toilet floor cleaning, etc.)

- **Autom Weightloss** coach provides recipes, tips, via robot to meet the individual users goals

Tablets

- **Apple a no-show (although plenty of iPads)**
  - Missed opportunity? Refuses to acknowledge or help the industry?
  - Tablets were everywhere both as product offerings and as tools for the presenters
    - 75 tablets displayed at CES
    - Generally, poor interoperability of the Android operating system with the hardware
- **Blackberry's Playbook**
  - Entry into the tablet world is the 7" Playbook
- **Motorola's Xoom** with Android 3.0 (*freshly* released tablet version of Android OS)
  - Combined with Google's own Google Talk video-calling software built in

	Apple iPad	Motorola Xoom
Display	9.7"	10.1"
RAM	256MB	1GB
Resolution	1024x768	1280x800
Camera	none	2 Cameras: 2MP & 5MP
Expandable Memory	none	32GB microSD

3DTelevisions

- Last year we saw the introduction of *active* 3DTVs, in the wake of the previous year's HDTV launch and ultra thin TVs
  - $20K for 42 inch home TV *and* very expensive proprietary glasses
  - Theater experience the best: Avatar

This year we are seeing huge improvements in *passive* technology (glasses) which is intended to drive adoption of 3DTV and increase overall 3DTV ownership

- Cheaper glasses (factor of 10)
- Less bulky, lighter
- **Universal… can use glasses with other systems including at movie theaters,** enabling further adoption of 3D technology in the home and with mobile devices

Internet Television

- Last year we saw the first few Internet capable TVs

This year nearly every big name manufacturer had them with keyboards, cameras for video chat and email capabilities

  - Remote controls with keypads allowing for true computer functionality:
    - **TiVo Slide**
    - **Logitech Revue**
    - **Netflix Enabled**

Healthcare Technology

- **Technologies to enable home care**
  - Digital testing connected to healthcare provider via mobile device
  - **GE Healthcare** Monitoring devices (non-video) to detect behavior changes and indicators of potential problems
  - **TabSafe** Home Medication Dispenser

- **Digitally enhanced fitness**
  - **BodyMedia** wearable body monitoring system sends results straight to smartphone app
  - Interactive workout and education experience enables learning during exercise
- **Integration / Connectivity**
  - **Androiter** application enables monitoring vital signs through **Google Health**

Smart Grid; Sustainability Controls Technology

- **Qualcomm** partnered with **SmartSynch** and **PayGo** to enable *pre-paid energy plans* where residents can monitor usage and balance online

- **GE Nucleus** displays and monitors a home's energy usage accessible via web and Smartphone apps

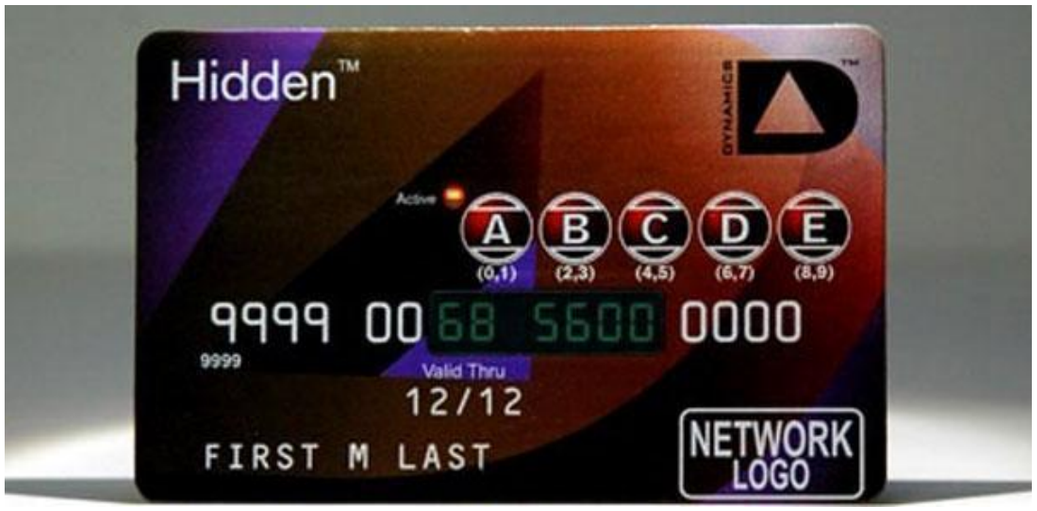
- **ThinkEco** offers the **Modlet** *smart plug* to turn off appliances when not in use and monitor usage online

Others Technologies to Watch…

NVIDIA 2008 - First personal super computer

- **Xi3** Modular Computer – small form factor, ability to network computers (pictured on left), leverage cloud computing capabilities to its fullest

Graphics card leader **Nvidia** is entering the CPU market, **challenging Intel and AMD**

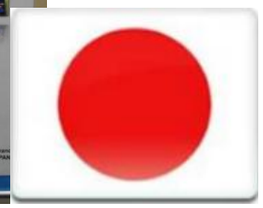


- Smarter Credit Cards: One card for multiple accounts, with physical key code by **Dynamics**

International Intentions…

Singapore: A country to watch. **Horizon Fuel Cell Technologies** presented **small-scale hybrid fuel cell systems**, co-brands science project kits with US DoE's National Renewable Energy Lab (NREL), and advertises online that they have a **dedicated aerospace and defense**

China: Expanded presence with electric vehicle (GM joint venture), **Haier** electrical appliances; companies **touting 3D display and green capabilities**



Japan: Osaka's trade commission stated they want to be the **capital of robotics**; numerous suppliers present

Seeing What's Next, Being What's Next

If last year was the year of breakthrough inventions and technologies… the iPad, gesture-based technologies, and 3DTV;

This year was the year of innovation… application and embedding of those inventions into our daily lives and the creation of new social networks.

What's Next? When companies come together and form ***Cross-Industry Partnerships*** – Laterally-thinking teams will join forces to bring emerging technologies into new spaces, like Ford with Best Buy/Geek Squad, and GM and SAIC… They will ensure that the power of computing will have a profound impact on every aspect of our lives!

Thank you. **Cameron Mehin, VMI,** Cameron@e-vmi.com

If you are interested in specific contacts or information about the above technologies, please let us know.

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